General

Guideline Title

Infection prevention and control guideline for cystic fibrosis: 2013 update.

Bibliographic Source(s)

Saiman L, Siegel JD, LiPuma JJ, Brown RF, Bryson EA, Chambers MJ, Downer VS, Fliege J, Hazle LA, Jain M, Marshall BC, O'Malley C, Pattee SR, Potter-Bynoe G, Reid S, Robinson KA, Sabadosa KA, Schmidt HJ, Tullis E, Webber J, Weber DJ. Infection prevention and control guideline for cystic fibrosis: 2013 update. Infect Control Hosp Epidemiol. 2014 Aug;35(Suppl 1):S1-S67. [500 references] PubMed

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Saiman L, Siegel J, Cystic Fibrosis Foundation. Infection control recommendations for patients with cystic fibrosis: microbiology, important pathogens, and infection control practices to prevent patient-to-patient transmission. Infect Control Hosp Epidemiol 2003 May;24(5 Suppl):S6–S52.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

Definitions of recommendation and certainty of net benefit (Low) are provided at the end of the "Major Recommendations" field.

I. Core Recommendations
The Cystic Fibrosis (CF) Foundation recommends implementation of the following core Infection Prevention and Control (IP&C) recommendations to minimize the risk of transmission and acquisition of pathogens among all people with CF, including following lung or liver transplantation, in all settings.

Education/Adherence Monitoring for Healthcare Personnel, People with CF, and Families

1. The CF Foundation recommends that all healthcare personnel caring for people with CF (e.g., the CF care team, inpatient staff, environmental services staff, research staff, and staff in diagnostic and therapeutic areas, including pulmonary function test [PFT] laboratories, radiology, phlebotomy, operating room, and physical therapy) receive education regarding IP&C for CF, using principles of adult learning. Education should be repeated at intervals each center deems appropriate (Saiman, Siegel, & CF Foundation, 2003 [Category II]; Siegel et al., 2006 [Category IB]; Siegel et al., 2007 [Category IB]).
2. The CF Foundation recommends that the CF care team develop strategies to monitor adherence to IP&C practices by healthcare personnel and provide feedback. Feedback to the CF care team includes immediate feedback to an individual when a lapse in

practice is observed and feedback to the entire CF care team of trends of overall adherence rates at regular intervals (e.g., quarterly) on the basis of consistency of practices (Saiman, Siegel, & CF Foundation, 2003 [Category IB]; Siegel et al., 2006 [Category IB]; Siegel et al., 2007 [Category IB]).

3. The CF Foundation recommends that all people with CF and their families receive education regarding IP&C for CF, using age appropriate tools and reading/language level appropriate to the target audience. Involve people with CF and their families in the development of educational programs and implementation of recommended practices. Education should be repeated at intervals each center deems appropriate (Saiman, Siegel, & CF Foundation, 2003 [Category II]).

Partnering with Institutional IP&C Teams

4. The CF Foundation recommends that CF care teams collaborate with their institutional IP&C teams to implement the recommendations in this guideline (Siegel et al., 2006 [Category IB]).
5. The CF Foundation recommends that CF care teams collaborate with their institutional IP&C teams to develop protocols, checklists, and audits to standardize implementation of practices for the following:
    a. Single-patient-use, disposable items
    b. Cleaning and disinfecting multiuse items (e.g., patient care equipment, oximeters, iPads and similar tablets, and computers)
    c. Cleaning and disinfecting surfaces in the healthcare environment (e.g., CF clinics, PFT rooms, hospital rooms, and sinks and showers)

    (Rutala & Weber, 2008 [Category II]; Centers for Disease Control and Prevention [CDC], "Options," 2010)

6. The CF Foundation recommends ensuring that dust containment during renovation and construction and water-leak remediation policies and practices are followed according to institutional and national guidelines in all ambulatory care areas and inpatient settings where people with CF receive care (Saiman, Siegel, & CF Foundation, 2003 [Category IB/IC]; Sehulster et al., 2003 [Category IB/IC]).
7. The CF Foundation recommends that healthcare personnel assume that *all* people with CF could have pathogens in respiratory tract secretions that are transmissible to other people with CF (Saiman, Siegel, & CF Foundation, 2003 [Category IA]).

Practices for Healthcare Personnel

8. The CF Foundation recommends that all healthcare facilities caring for people with CF ensure ready availability of alcohol-based hand rub or antimicrobial soap and water in all patient rooms, PFT rooms, and waiting areas (Saiman, Siegel, & CF Foundation, 2003 [Category IA]; Word Health Organization [WHO], 2009 [Category IA]; Boyce & Pittet, 2002 [Category IA]).
9. The CF Foundation recommends that healthcare personnel perform *hand hygiene* (either using alcohol-based hand rub or washing hands with antimicrobial soap and water), as per CDC and WHO guidelines, in the following clinical situations:
    a. Before entering the room and when leaving the room of any patient
    b. Before and after direct contact with any patient
    c. Before putting gloves on and after removing gloves, for both sterile and nonsterile procedures
    d. After contact with patient's skin, mucous membranes, respiratory secretions, or other body fluids
    e. After contact with inanimate objects (including medical equipment) in the vicinity of the patient that may be potentially contaminated with respiratory secretions

    (Saiman, Siegel, & CF Foundation, 2003 [Category IA]; WHO, 2009 [Category IA]; Boyce & Pittet, 2002 [Category IA])

10. The CF Foundation recommends that healthcare personnel should not wear artificial fingernails or nail extenders when having direct contact with people with CF (Boyce & Pittet, 2002 [Category IA for high-risk patients]; WHO, 2009 [Category IA for all patients]).
11. The CF Foundation recommends that healthcare personnel should disinfect their stethoscopes before and after use on each patient in accordance with institutional IP&C policies. Stethoscopes that remain in the patient's room and are dedicated for use only for that patient do not need to be disinfected before and after use (Siegel et al., 2006 [Category IB]).
12. The CF Foundation recommends that healthcare personnel caring for people with CF should *not* be routinely screened for methicillin-resistant *Staphylococcus aureus* (MRSA) colonization unless they are epidemiologically linked to a cluster of MRSA infections in accordance with institutional IP&C policies and national guidelines (Siegel et al., 2006 [Category IB]).

Isolation Precautions

13. The CF Foundation recommends that all healthcare personnel implement *Contact Precautions* (i.e., wear a gown and gloves) when caring for all people with CF regardless of respiratory tract culture results, in ambulatory and inpatient settings (Siegel et al., 2007 [Category IB/IC]).
14. The CF Foundation does not recommend that healthcare personnel wear a mask *routinely* when caring for people with CF. However, the CF Foundation recommends mask use per CDC guidelines, as follows:
    a. Surgical (procedure, isolation) masks are worn by healthcare personnel caring for any patient under *Droplet Precautions* with

suspected or confirmed pathogens that are transmitted by the droplet route (e.g., adenovirus, rhinovirus, influenza virus, or *Mycoplasma pneumoniae*).

b. Masks and eye protection should be worn by healthcare personnel if splashes or sprays of respiratory tract secretions are anticipated as per *Standard Precautions*.

c. N-95 respirators (masks) or powered air-purifying respirators (PAPRs) are worn by healthcare personnel caring for any patient under *Airborne Precautions* (in an airborne infection isolation room [AIIR]) for suspected or confirmed infection with *Mycobacterium tuberculosis*.

(Saiman, Siegel, & CF Foundation, 2003 [Category IA]; Siegel et al., 2007 [Category IB]; Jensen et al., 2005 [Category IB])

15. The CF Foundation recommends placing people with CF who are acid-fast bacilli (AFB) smear positive *for the first time* under *Airborne Precautions* (AIIR requirements: negative-pressure single room, more than 12 air exchanges per hour, air exhausted to the outside) in ambulatory and inpatient settings until *M. tuberculosis* infection has been excluded. Alternatively, in geographic locations with a very low incidence of TB, a risk assessment that includes the likelihood of exposure to individuals with tuberculosis (TB) (e.g., travel or visitors from high-prevalence areas) may be used to guide the use of AIIRs. Consult with institutional IP&C staff and/or infectious disease physicians (Saiman, Siegel, & CF Foundation, 2003 [Category IA]; Jensen et al., 2005; Siegel et al., 2007 [Category IA/IC]).
16. The CF Foundation concludes that there is insufficient evidence at the time of publication of this document for or against placing people with CF who are infected with nontuberculous Mycobacteria (NTM) under *Airborne Precautions* (Certainty: low).

Practices by People with CF and Family Members/Friends

17. The CF Foundation recommends that all people with CF, *regardless of their respiratory tract culture results*, be separated by at least 6 feet (2 meters) from other people with CF in all settings, to reduce the risk of droplet transmission of CF pathogens. This does not apply to members of the same household.
18. The CF Foundation recommends that all people with CF and their family members/friends perform hand hygiene (with either alcohol-based hand rub or antimicrobial soap and water) when there is potential for contamination of hands with pathogens, such as the following:
    a. Entering and exiting CF clinics, clinic exam rooms, or hospital rooms
    b. Hands become contaminated with respiratory secretions (e.g., after coughing or performing PFTs or chest physiotherapy)

    (Saiman, Siegel, & CF Foundation, 2003 [Category IA])
19. The CF Foundation does not recommend that people with CF wear gowns or gloves in CF clinics, in other ambulatory healthcare settings, or while hospitalized.
20. The CF Foundation recommends that people with CF be instructed to follow *Respiratory Hygiene* practices to contain their secretions when coughing or sneezing (i.e., cough into a tissue, immediately discard soiled tissue into a trash receptacle, and perform hand hygiene after disposing of soiled tissues). A covered trash receptacle with a foot pedal is preferred. (Saiman, Siegel, & CF Foundation, 2003 [Category II]; Siegel et al., 2007 [Category IB]).
21. The CF Foundation recommends that all people with CF wear a surgical (procedure, isolation) mask when in a healthcare facility to reduce the risk of transmission or acquisition of CF pathogens. Masks should be worn throughout the facility, including in restrooms. Masks should *not* be worn during pulmonary function testing, in the clinic exam room, or in the patient's hospital room. If the optimal size mask is not available (e.g., for small infants), use the smallest mask available. If a mask is not tolerated by an individual with CF who is having respiratory distress, encourage that person to follow *Respiratory Hygiene* practices. Masks should be changed when wet (Siegel et al., 2007 [Category IB]).
22. The CF Foundation recommends that all people with CF who *do not* live in the same household avoid activities and risk factors that are associated with transmission of CF pathogens in nonhealthcare and healthcare settings, including the following:
    a. Social contact between people with CF
    b. Physical contact between people with CF (e.g., handshakes, kissing, and intimate contact)
    c. Car rides with another person with CF
    d. Sharing hotel rooms with another person with CF
    e. Fitness class with another person with CF

    Activities that all people with CF, including those who live in same household, should avoid include the following:

    a. Sharing personal items (e.g., toothbrush and drinking utensils) with another person with CF
    b. Sharing respiratory therapy equipment

    (Saiman, Siegel, & CF Foundation, 2003 [Category IA]; Guzman-Cottrill et al., 2013)
23. The CF Foundation recommends that

a. Tap water or well water that meets local public health standards, distilled water, or bottled water may be used by people with CF
    i. For *drinking*
    ii. For *bathing*
    iii. For *cleaning* nebulizers and other respiratory equipment (e.g., airway clearance devices, spacers, and neti pots) if followed by *disinfection*
    iv. For the water needed for *heat disinfection* (e.g., boiling, microwaving, and steam sterilizing)
b. Only *sterile* water be used for nasal rinses (e.g., neti pots), filling of humidifier reservoirs, and as a final rinse of respiratory equipment (e.g., after cold disinfection)

Immunizations/Influenza Chemoprophylaxis

24. The CF Foundation recommends that, as per CDC/Advisory Committee on Immunization Practices (ACIP) recommendations, all healthcare personnel (unless there is a medical contraindication to immunization) should be immunized or have evidence of immunity to mumps, measles, rubella, varicella, pertussis (Tdap), and hepatitis B and receive an annual influenza immunization (CDC, "Prevention," 2013; "Immunization," 2013).
25. The CF Foundation recommends that, as per CDC/ACIP recommendations, all people with CF and their family members/close contacts receive recommended vaccines at the recommended schedule, age, dose, and route of administration unless there is a medical contraindication (CDC, "Prevention," 2013; CDC, "Immunization," 2013)
26. The CF Foundation recommends use of antiviral chemoprophylaxis or treatment (e.g., oseltamivir) for prevention or treatment of influenza according to ACIP recommendations (Saiman, Siegel, & CF Foundation, 2003 [Category IA]; CDC, "Influenza," 2013).

Research Settings

27. The CF Foundation recommends that for all research activities, people with CF, their family members/friends, and healthcare personnel follow relevant IP&C recommendations for that healthcare setting.

II. Recommendations for Microbiology and Molecular Epidemiology

In addition to the microbiology recommendations for processing CF respiratory specimens described in the 2003 Infection Control Guideline for CF (Saiman, Siegel, & CF Foundation, 2003), the CF Foundation recommends implementation of the following recommendations:

Review Center-Specific Microbiology Data

28. The CF Foundation recommends that all CF centers obtain and review center-specific quarterly surveillance reports (e.g., data from the local clinical microbiology laboratory or the CF Foundation Patient Registry) of the incidence and prevalence of respiratory tract pathogens at their centers. This review should be conducted in collaboration with institutional IP&C teams and microbiology laboratory directors (Saiman, Siegel, & CF Foundation, 2003 [Category IB]; Siegel et al., 2006 [Category IB]).

Molecular Typing

29. The CF Foundation recommends that CF isolates of *Burkholderia* spp. be sent to the laboratory at the University of Michigan (US) for confirmation of identification, speciation, and molecular typing, as follows:
    a. All initial isolates from every patient
    b. At least 1 isolate per patient per year
    c. Any isolates suspected of being associated with transmission or an outbreak
    d. Any other nonfermenting gram-negative organism for which species identification remains equivocal after routine analysis should be sent for confirmation of identification

    (Saiman, Siegel, & CF Foundation, 2003 [Category IB])

30. The CF Foundation recommends that molecular typing of *B. cepacia* complex isolates and other microorganisms (e.g., *P. aeruginosa* and NTM) be performed when epidemiologically indicated (e.g., suspected patient-to-patient transmission) (Saiman, Siegel, & CF Foundation, 2003 [Category IA]; Siegel et al., 2006 [Category IB]).
31. The CF Foundation recommends that molecular typing be performed using an appropriate genotyping method (e.g., pulsed-field gel electrophoresis, random-amplified polymorphic DNA polymerase chain reaction [PCR], repetitive sequence-based PCR, or multilocus sequence typing) (Saiman, Siegel, & CF Foundation, 2003 [Category IA]; Siegel et al., 2006 [Category IB]).

Surveillance

32. The CF Foundation and European CF Society (ECFS) recommend that screening cultures for NTM should be performed annually in individuals with a stable clinical course. Culture and smears for AFB from sputum should be used for NTM screening.

In the absence of clinical features suggestive of NTM pulmonary disease, individuals who are not capable of spontaneously producing sputum do not require screening cultures for NTM. The CF Foundation and ECFS recommend against the use of oropharyngeal swabs for NTM screening (Leung & Oliver, 2013).

33. The CF Foundation concludes that there is insufficient evidence at the time of publication of this document to recommend criteria by which to consider a person with CF who previously had *Burkholderia* species isolated from respiratory tract cultures to be *Burkholderia*-free [Certainty: low].

III. Recommendations for CF Clinics and Other Ambulatory Care Settings

In addition to the core recommendations, the CF Foundation recommends implementing the following recommendations in CF clinics and other ambulatory care areas, including those clinics where people with CF who have undergone lung or liver transplantation are followed.

Scheduling in CF Clinics

34. The CF Foundation recommends that CF clinics schedule and manage people with CF in ways to minimize time in common waiting areas. Such strategies include the following:
    a. Stagger clinic schedule
    b. Place people with CF *regardless of their respiratory culture results* in an exam room immediately on arrival to the clinic
    c. Use a pager system or personal cell phone to alert people with CF that an exam room is available
    d. Keep a person with CF in one exam room while the CF care team rotates through the exam room
    e. Do not share common items (e.g., clinic computer and toys), and request that people with CF bring their own recreational items to clinic appointments

    (Saiman, Siegel, & CF Foundation, 2003 [Category II])

35. The CF Foundation recommends that infants under 2 years of age be separated from other people with CF in CF clinics until adequate infection control education has been provided to and is understood by the caregivers. See the Cystic Fibrosis Foundation evidence-based guidelines for management of infants with cystic fibrosis (Certainty: low).
36. The CF Foundation recommends that all newly diagnosed people with CF be separated from other people with CF in CF clinics until adequate IP&C education has been provided to and is understood by newly diagnosed individuals and their caregivers.
37. The CF Foundation concludes that there is insufficient evidence at the time of publication of this document for or against routinely scheduling CF clinics *on the basis of specific pathogens* isolated from respiratory tract cultures (Certainty: low).

Pulmonary Function Testing

38. The CF Foundation recommends that PFTs be performed in one of the following ways:
    a. In the exam room at the beginning of the clinic visit
    b. In a negative-pressure room (AIIR)
    c. In a PFT laboratory with either portable or integrated high-efficiency particulate (HEPA) filters
    d. In a PFT laboratory without HEPA filtration, allowing 30 minutes to elapse before the next person with CF enters the PFT laboratory

Environmental Practices

39. The CF Foundation recommends that exam rooms be cleaned and disinfected between patients using a 1-step process and Environmental Protection Agency (EPA)–registered hospital-grade disinfectant/detergent designed for housekeeping in accordance with institutional IP&C policies (Saiman, Siegel, & CF Foundation, 2003 [Category IB]).

Designing a New CF Clinic

40. The CF Foundation recommends that the leadership staff of CF centers collaborate with the institutional IP&C and planning design and construction departments when designing a new CF clinic to ensure a design that includes the following:
    a. Provision for management of people with CF who require *Airborne Precautions*
    b. Appropriate number of exam rooms
    c. Single-person restrooms
    d. Adequate space for personal protective equipment (e.g., masks, gowns, and gloves) *at the point of use*

IV. Recommendations for Inpatient Settings

In addition to the core recommendations, the CF Foundation recommends implementing the following recommendations in inpatient settings, including those units where people with CF who have undergone lung or liver transplantation are located.

Room Placement

41. The CF Foundation recommends that people with CF be placed in a single-patient room. Only people with CF who live in the same household may share a hospital room (Saiman, Siegel, & CF Foundation, 2003 [Category II]; Siegel et al., 2006 [Category IB]).
42. The CF Foundation recommends placing people with CF who are solid-organ transplant recipients in a single patient room in accordance with institutional policy and national guidelines. There is insufficient evidence to recommend for or against *Protective Environment* (i.e., positive pressure room and HEPA filtration) for solid-organ recipients (Saiman, Siegel, & CF Foundation, 2003 [Category II]; Siegel et al., 2007 [No recommendation, unresolved issue]).

Practices for People with CF and Their Families

43. The CF Foundation recommends evaluating people with CF on a case-by-case basis in accordance with institutional IP&C policies for participation in activities outside the hospital room (e.g., walking in the hallway, going to the playroom, physical therapy, exercise room, or school room) *only when no other person with CF is present* and under the supervision of a trained staff member. Considerations include the capability of a person with CF to contain his or her respiratory tract secretions, age, endemic levels of pathogens in an individual center, and adherence to the following practices:

    a. Perform hand hygiene and put on a mask immediately before leaving patient rooms
    b. After a person with CF has left a hospital activity room, clean surfaces and touched items with an EPA-registered hospital disinfectant/detergent

    (Saiman, Siegel, & CF Foundation, 2003 [Category IB/II])

44. The CF Foundation recommends that all people with CF perform all respiratory interventions (e.g., aerosol therapy, airway clearance, and collection of respiratory tract cultures) in the patients' rooms. If 2 people with CF who live in the same household are sharing a room, these procedures should be performed when the second person is not in the room, whenever possible (Saiman, Siegel, & CF Foundation, 2003 [Category IB]).
45. The CF Foundation recommends that airway clearance devices (e.g., flutter, acapella, pep device, and therapy vest) be for single-patient use only, in accordance with institutional IP&C policies (Saiman, Siegel, & CF Foundation, 2003 [Category II]).
46. The CF Foundation recommends following institutional IP&C policies for the use of masks, gowns, and gloves by individuals who are visiting hospitalized people with CF (Siegel et al., 2007 [No recommendation, unresolved issue]).

Care of Nebulizers in the Hospital

47. The CF Foundation recommends the following:
    a. Nebulizers are for single-patient use only
    b. Aseptic technique is always followed when handling the nebulizer and dispensing medications
    c. Single-dose vials of medication used in nebulizers are always preferred
    d. Handheld *disposable* nebulizers are managed as follows:
        i. *After each use*, rinse out residual volume with sterile water and wipe mask/mouthpiece with an alcohol pad
        ii. Discard the nebulizer every 24 hours
    e. Handheld reusable nebulizers (e.g., home equipment) are managed as follows:
        i. *After each use*, clean, disinfect, rinse with sterile water (if applicable, following cold disinfection method), and air dry away from sink
        ii. *After each use*, the nebulizer can be reprocessed (e.g., by steam sterilization) if the reprocessing is performed according to the manufacturer's instructions and the CF Foundation recommendations for home care (rec. 59) and if the nebulizer can be returned to the patient in time for the next treatment

    (Saiman, Siegel, & CF Foundation, 2003 [Category II]; Tablan et al., 2004 [Category IB]; Rutala & Weber, 2008 [Category IB])

Animals

48. The CF Foundation recommends that people with CF can participate in animal-assisted ("pet") therapy in accordance with institutional policies (Sehulster et al., 2003 [Category II]).

Designing New Inpatient Facilities

49. The CF Foundation recommends that the leadership staff of CF centers collaborate with the institutional IP&C and the planning, design, and construction departments when designing a new inpatient unit to ensure a design that
    a. Provides an adequate number of single-patient rooms to care for people with CF
    b. Includes a provision for people with CF who require possible *Airborne Precautions*
    c. Provides access to exercise during hospitalization (e.g., adequate space for exercise equipment)
    d. Provides adequate space for personal protective equipment (e.g., masks, gowns, and gloves) *at the point of use*

V. Recommendations for Nonhealthcare Settings

In addition to the core recommendations, the CF Foundation recommends implementing the following recommendations in nonhealthcare settings.

Families with More than 1 Person with CF

50. The CF Foundation recommends that it is preferable that people with CF who live in the same household perform airway clearance with only 1 person with CF in the room during treatment (Saiman, Siegel, & CF Foundation, 2003 [Category II]).

Events and Activities

51. The CF Foundation recommends against CF-specific camps or CF-specific educational retreats for groups of people with CF. Only 1 individual with CF should attend any camp or educational retreat unless they live in the same household. However, family members who do not have CF may attend educational retreats. People with CF are encouraged to participate in camps and sports with non-CF individuals (Saiman, Siegel, & CF Foundation, 2003 Category IB).
52. People with CF and their parents or legal guardians are *not* obligated to disclose the diagnosis of CF or the results of respiratory tract cultures to school or day care personnel. However, the CF Foundation recommends disclosure so that school or day care personnel can be made aware of the importance of IP&C principles and practices for the protection of students with CF and can make the recommended accommodations. Such information must be maintained as confidential medical information unless the person with CF and/or parent or legal guardian choose to make this information known (Saiman, Siegel, & CF Foundation, 2003, Category II).
53. The CF Foundation recommends that people with CF attending the same day care and/or school should *not* be in the same room at the same time unless they live in the same household. The CF Foundation recommends education of day care/school personnel on the principles of IP&C for CF so they can work with people with CF and/or parents or legal guardians to develop strategies to minimize contact between people with CF (e.g., assignment to separate classrooms and separation during other scheduled common activities, including lunch, physical education, and recess) (Saiman, Siegel, & CF Foundation, 2003 [Category II]).
54. The CF Foundation recommends that only 1 person with CF attend CF Foundation–sponsored, healthcare-sponsored, or CF center–sponsored *indoor events* (e.g., CF Education Days) unless they live in the same household, to reduce the risk of person-to-person transmission of CF pathogens.
55. The CF Foundation recommends developing and utilizing alternative CF education programs, (e.g., videotapes, video conferencing, CD-ROM web-based learning, and apps) that do not require face-to-face meetings among people with CF (Saiman, Siegel, & CF Foundation, 2003 [Category II]).
56. The CF Foundation recommends that people with CF can attend CF Foundation–sponsored, healthcare-sponsored, or CF center–sponsored *outdoor events* (e.g., Great Strides) providing they maintain a distance of at least 6 feet (2 meters) from others with CF.

MRSA

57. The CF Foundation recommends that people with CF should avoid direct contact with people with skin and soft tissue infections caused by MRSA *unless* wounds are covered, hand hygiene is performed frequently, personal items (e.g., towels) are not shared, sports equipment is cleaned between use, and cleaning protocols for environmental surfaces are established to reduce the risk of MRSA transmission (CDC, "MRSA," 2010).
58. The CF Foundation recommends that people with CF and respiratory cultures positive for MRSA should not be restricted from contact with people without CF in congregate settings (e.g., sports teams, classrooms, and the workplace) if the person with CF performs appropriate hand and respiratory hygiene (CDC, "MRSA," 2010).

Nebulizers: Cleaning and Disinfecting

59. The CF Foundation recommends that the following steps be performed for nebulizers used in the home as soon as possible after each use:
    a. *Clean* the nebulizer parts with dish detergent soap and water
    b. *Disinfect* the nebulizer parts using *one* of the following methods.

Heat Methods

a. Place in boiling water and boil for 5 minutes
b. Place in a microwave-safe receptacle submerged in water and microwave for 5 minutes
c. Use a dishwasher if the water is more than or equal to 70°C or 158°F for 30 minutes.
d. Use an electric steam sterilizer

Cold Methods

a. *Soak* in 70% isopropyl alcohol for 5 minutes

b. *Soak* in 3% hydrogen peroxide for 30 minutes
    i. *Rinse* off the cold-method disinfectant using sterile water, not tap water; the *final rinse* must be with sterile or filtered (less than or equal to 0.2-micron filter) water
    ii. *Air dry* the nebulizer parts before storage

(Saiman, Siegel, & CF Foundation, 2003 [Category II])

60. The CF Foundation recommends that nebulizers used in the home should *not* be disinfected with acetic acid (vinegar), bleach solutions, or benzalkonium chloride (e.g., "Control III").

Leisure Activities

61. The CF Foundation recommends that people with CF should limit prolonged and/or repeated exposure to activities that generate dust from soil and organic matter (e.g., gardening and lawn mowing) to decrease exposure to potential soilborne pathogens (e.g., *Burkholderia* spp. and *Aspergillus* spp.).
62. The CF Foundation recommends that people with CF should avoid exposure to construction and renovation activities that generate dust to decrease exposure to potential pathogens (e.g., *Aspergillus* spp.).
63. The CF Foundation recommends that people with CF can swim in pools or water parks with adequate disinfection (e.g., chlorination).
64. The CF Foundation recommends that people with CF avoid activities in hot tubs, whirlpool spas, and stagnant water.
65. There is insufficient evidence at the time of publication of this document for the CF Foundation to recommend for or against people with CF avoiding activities in natural bodies of water that are not stagnant (e.g., ocean, ponds, and hot springs) [Certainty: low].

Contact with Pets or Farm Animals

66. The CF Foundation recommends that people with CF perform hand hygiene after changing the litter, handling feces, cleaning and disinfecting the cages or fish tanks of their pets, or interacting with farm animals (CDC, "Healthy pets," 2013).
67. The CF Foundation recommends that people with CF avoid cleaning stalls, pens, or coops.

VI. Recommendations for Healthcare Personnel with CF

In addition to the core recommendations, the CF Foundation recommends implementing the following recommendations for healthcare personnel with CF.

68. The CF Foundation recommends that healthcare personnel with CF should not provide care for other people with CF.
69. The CF Foundation recommends that people with CF interested in a career in healthcare receive counseling from their CF care team regarding specialty areas wherein job duties minimize the risk of transmission or acquisition of potential pathogens (Saiman, Siegel, & CF Foundation, 2003 [Category II]).
70. The CF Foundation recommends that healthcare personnel with CF consider informing their employers' workforce health and safety department about their diagnosis of CF to ensure that job duties are assigned and care practices are adopted that minimize the risk of acquisition or transmission of potential pathogens. This disclosure is legally required to be kept confidential.
71. The CF Foundation recommends that when it is known that a healthcare provider with or without CF is infected/colonized with MRSA, work assignments should be made according to local hospital policy (Saiman, Siegel, & CF Foundation, 2003 [Category II]).
72. The CF Foundation recommends that healthcare personnel with CF be assigned to care for patients without CF on a case-by-case basis, considering health- and behavior-related factors, such as
    a. Frequency and severity of coughing episodes, quantity of sputum production during these episodes, and ability to contain respiratory tract secretions
    b. Ability to use barrier precautions and adhere to IP&C guidelines, Centers for Medicare & Medicaid Services, Healthcare Infection Control Practices Advisory Committee (HICPAC), and CDC guidelines
    c. Risk of transmission of pathogens by healthcare personnel with CF in the context of specific job duties.

(Saiman, Siegel, & CF Foundation, 2003 [Category II])

VII. Recommendations for Psychosocial and Medical Impact of IP&C

The CF Foundation recommends implementing the following recommendations to reduce the psychosocial impact of IP&C for people with CF, their families, and healthcare personnel.

73. The CF Foundation recommends educating, when appropriate, friends, teachers, employers, and coworkers about the rationale for the IP&C recommendations (Saiman, Siegel, & CF Foundation, 2003 [Category II]).
74. The CF Foundation recommends identifying CF center–specific concerns for the potential psychosocial impact of the IP&C guideline for people with CF in the hospital, clinic, community, school, and home and strategies, *including an available counselor*, to

minimize the negative impact (Saiman, Siegel, & CF Foundation, 2003 [Category II]).

75. The CF Foundation recommends that the CF care team inform people with CF and their parents or legal guardians of their microbiologic status. People with CF and their parents or legal guardians will then determine whom they will inform (Saiman, Siegel, & CF Foundation, 2003 [Category II]).
76. The CF Foundation recommends collaboration with the child life staff to ensure individualized programs consistent with the recommended IP&C guidelines (Saiman, Siegel, & CF Foundation, 2003 [Category II]).
77. The CF Foundation recommends making accommodations (e.g., providing entertainment, enhancing communication with the outside world, facilitating visits with non-CF individuals, and adapting child life programs) to relieve the psychosocial stress of inpatient and outpatient IP&C guidelines without placing people with CF at risk for transmission or acquisition of pathogens (Saiman, Siegel, & CF Foundation, 2003 [Category II]).

Definitions:

Grading Systems Used in the Updated IP&C Guidelines for CF, 2013

Source of Recommendation	Grading Strategy	Comments
2003 Infection Control Guideline for CF and CDC HICPAC guidelines and WHO Guidelines on Hand Hygiene in Healthcare, 2009	Category IA	Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies
	Category IB	Strongly recommended for implementation and supported by some experimental, clinical, or epidemiologic studies and a strong theoretical rationale
	Category IC	Required for implementation, as mandated by federal and/or state regulation or standard
	Category II	Suggested for implementation and supported by suggestive clinical or epidemiologic studies or a theoretical rationale
	No recommendation	*Unresolved issue;*[a] practices for which insufficient evidence or no consensus regarding efficacy exist
Systematic review	Not applicable	Limited evidence was found by the systematic review conducted for the 2013 IP&C guideline; thus, the grading of evidence was not used
2013 Updated IP&C Guideline for CF	% agreement Certainty: low	≥80% agreed with statement by anonymous voting <80% agreed with statement by anonymous voting and thus insufficient evidence exists to recommend for or against

Note: CDC, Centers for Disease Control and Prevention; HICPAC, Healthcare Infection Control Practices Advisory Committee; WHO, World Health Organization.

[a]The *unresolved issue* category was not included in the 2009 WHO hand hygiene guidelines.

Clinical Algorithm(s)

None available

Scope

Disease/Condition(s)

Cystic fibrosis (CF)

Guideline Category

Management

Prevention

Risk Assessment

Clinical Specialty

Family Practice

Infectious Diseases

Internal Medicine

Pediatrics

Preventive Medicine

Pulmonary Medicine

Intended Users

Advanced Practice Nurses

Health Care Providers

Hospitals

Nurses

Patients

Physician Assistants

Physicians

Respiratory Care Practitioners

Guideline Objective(s)

- To reduce substantially the risk of transmission and acquisition of cystic fibrosis (CF) pathogens, while recognizing that the risk is unlikely to reach zero
- To provide a more comprehensive understanding of effective strategies to optimize safety for this unique population

Target Population

Adults and children with cystic fibrosis (CF) and their caregivers

Interventions and Practices Considered

1. Education and development of adherence monitoring strategies for healthcare personnel, people with cystic fibrosis (CF), and families
2. Partnering with Infection Prevention and Control (IP&C) teams
3. Healthcare personnel practices
    - Hand hygiene
    - Disinfection of stethoscopes
4. Isolation precautions for clinicians and patients/family
    - Wearing of gown, gloves, surgical mask by hospital personnel
    - Placing of persons with CF who are acid-fast bacilli (AFB) smear positive for the first time under airborne precautions
    - Separation of people with CF from others with CF
    - Appropriate hand hygiene for all people with CF and their family members and friends

    - Respiratory hygiene practices
    - Avoidance of activities that can transmit CF pathogens
    - Use of clean water
5. Immunizations/influenza chemoprophylaxis
6. Review of microbiologic surveillance information
7. Molecular typing
8. Screening tests for specific pathogens
9. Appropriate scheduling of patients to avoid time in common areas
10. Pulmonary function test (PFT) practices to reduce transmission
11. Cleaning and disinfection of exam rooms
12. Consideration for events and activities
    - Minimizing contact between people with CF
    - Disclosure of CF status to school or day care personnel
    - Limiting activities that generate or cause contact with dust
    - Considerations for pools, common swim areas, stagnant water, and fresh water
    - Performing hand hygiene after contact with pets or farm animals
    - Alternative CF education programs to avoid-face-to-face contact
13. Education on IP&C
    - Avoidance of methicillin-resistant *Staphylococcus aureus* (MRSA)
    - Healthcare personnel with CF
    - Nebulizer cleaning and disinfecting
    - Psychological and medical impact

Note: The following were considered but not recommended: routine screening for MRSA colonization and wearing of gloves and masks by people with CF in clinical settings.

Major Outcomes Considered

- Lung function
- Quality of life
- Morbidity and mortality
- Contamination
- Transmission
- Psychosocial benefit or harm
- Adherence

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Systematic Review Process

For the systematic review, searches of PubMed, EMBASE, and the Cochrane Central Register of Controlled Studies were conducted by the Johns Hopkins University research team in June 2012. Searches of reference lists for all eligible articles and Cochrane reviews were also completed. Committee members provided additional potentially eligible studies. Studies performed in the cystic fibrosis (CF) population were sought preferentially, but studies conducted in other populations considered relevant were also reviewed. Two independent reviewers screened

search results for eligible studies. Details about eligible studies were abstracted and a report, including evidence tables and qualitative synthesis, was submitted to the CF Foundation and disseminated to the committee.

Additionally, the Johns Hopkins University research team identified relevant guidelines and Cochrane reviews through searches (completed in August 2012) of the National Guideline Clearinghouse, United Kingdom CF Trust website, CF Foundation guidelines database, the Cochrane Library, and lists provided by the committee chairs. Details from these sources, including recommendation statements, were abstracted and provided to the committee.

Number of Source Documents

The evidence review identified a total of 2,031 unique citations. 1,857 citations were excluded during abstract screening. During full-text screening (n=174) a further 121 citations were excluded, 35 were flagged as background, and the full-text for 3 citations was unable to be retrieved, leaving 15 studies (published in 16 articles) as eligible for inclusion in the evidence review (see the "Availability of Companion Documents" field).

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus (Committee)

Rating Scheme for the Strength of the Evidence

Not applicable

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): The Cystic Fibrosis Foundation commissioned an evidence review from Johns Hopkins University for this guideline (see the "Availability of Companion Documents" field).

Data Analysis

Data abstraction forms were developed based on the forms from prior projects (see Appendix B in the evidence review). The forms were translated into a custom Web-based systematic review data extraction and storage system (Systematic Review Data Repository, Agency for Healthcare Research and Quality, Rockville, MD). Two reviewers abstracted information about study and participant characteristics, and about outcomes from each eligible article. Data from Systematic Review Data Repository was downloaded into a project-specific relational database (Access, Microsoft, Redmond, WA). Evidence tables were created from the database and were submitted as Excel spreadsheets (Microsoft, Redmond, WA).

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Process for Inclusion of Recommendations

Each recommendation from the 2003 Infection Control Guideline for cystic fibrosis (CF) was reviewed for continued relevance and modified if clarification was needed or if new data were available. The grade of evidence from the 2003 Infection Control Guideline for CF was retained. Relevant recommendations from other CF practice guidelines were included verbatim. Relevant recommendations from other guidelines developed for non-CF populations by other expert professional organizations, including Centers for Disease Control and Prevention (CDC)/Healthcare

Infection Control Practices Advisory Committee (HICPAC), Society for Healthcare Epidemiology of America (SHEA), Infectious Diseases Society of America (IDSA), World Health Organization (WHO), Association for Professionals in Infection Control (APIC), and the Advisory Committee on Immunization Practices (ACIP) were also included, and their grade of evidence was retained without a vote by the committee (see Table 3 in the original guideline document). New recommendations that had not been published previously were developed by the committee. Inclusion of the recommendations was determined by anonymous voting. At least 80% approval by the committee members (i.e., consensus) was set as the threshold for acceptance of new recommendations, relevant recommendations from the 2003 Infection Control Guideline for CF, or relevant recommendations from other guidelines developed for non-CF populations.

The CDC/HICPAC guidelines and the WHO hand hygiene guideline cited in this document used a unique HICPAC grading system that was used for HICPAC guidelines published before 2009. The Grading of Recommendations Assessment, Development and Evaluation (GRADE) system was adopted for use by CDC/HICPAC/ACIP in 2009 and is used by more than 70 organizations worldwide. However, the GRADE system can result in Infection Prevention and Control (IP&C) guidelines that are more likely to include expert consensus compared with guidelines developed for specific treatment regimens that have randomized clinical trials as their evidence base. Limitations of the GRADE system that may impact developing IP&C guidelines include (1) questions for which little or no evidence is available on which to base a recommendation, (2) little or no requirement for evidence given the high probability of a recommendation's success, and (3) difficulty assessing the strength of evidence from studies performed in varying populations with varying study designs. The evidence base for this updated guideline had similar limitations; thus, the recommendations in this guideline are often based on expert consensus.

Rating Scheme for the Strength of the Recommendations

Grading Systems Used in the Updated Infection Prevention and Control (IP&C) Guidelines for Cystic Fibrosis (CF), 2013

Source of Recommendation	Grading Strategy	Comments
2003 Infection Control Guideline for CF and CDC HICPAC guidelines and WHO Guidelines on Hand Hygiene in Healthcare, 2009	Category IA	Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies
	Category IB	Strongly recommended for implementation and supported by some experimental, clinical, or epidemiologic studies and a strong theoretical rationale
	Category IC	Required for implementation, as mandated by federal and/or state regulation or standard
	Category II	Suggested for implementation and supported by suggestive clinical or epidemiologic studies or a theoretical rationale
	No recommendation	*Unresolved issue;*[a] practices for which insufficient evidence or no consensus regarding efficacy exist
Systematic review	Not applicable	Limited evidence was found by the systematic review conducted for the 2013 IP&C guideline; thus, the grading of evidence was not used
2013 Updated IP&C Guideline for CF	% agreement Certainty: low	≥80% agreed with statement by anonymous voting <80% agreed with statement by anonymous voting and thus insufficient evidence exists to recommend for or against

Note: CDC, Centers for Disease Control and Prevention; HICPAC, Healthcare Infection Control Practices Advisory Committee; WHO, World Health Organization.

[a]The *unresolved issue* category was not included in the 2009 WHO hand hygiene guidelines.

Cost Analysis

The guideline developers reviewed published cost analyses.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

External Review

In May 2013, the Cystic Fibrosis (CF) Foundation made a draft of the updated guideline available for comment to the CF community, including the teams at CF care centers and people with CF. Infection preventionists and healthcare epidemiologists were also notified of the availability of the document for comment. All comments were considered by the committee, and the recommendations and background information were revised as appropriate. This guideline was reviewed and endorsed by The Society for Healthcare Epidemiology of America (SHEA) and by the Association for Professionals in Infection Control (APIC).

Evidence Supporting the Recommendations

References Supporting the Recommendations

Boyce JM, Pittet D, Healthcare Infection Control Practices Advisory Committee, HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Guideline for hand hygiene in health-care settings. Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Society for Healthcare Epidemiology of America/Association for Professionals in Infection Control/Infectious Diseases Society of America. MMWR Recomm Rep. 2002 Oct 25;51(RR-16):1-45, quiz CE1-4. PubMed

Centers for Disease Control and Prevention (CDC). Prevention and control of seasonal influenza with vaccines. Recommendations of the Advisory Committee on Immunization Practices--United States, 2013-2014. MMWR Recomm Rep. 2013 Sep 20;62(RR-07):1-43. PubMed

Centers for Disease Control and Prevention. Healthy pets healthy people. [internet]. 2013 [accessed 2014 Jan 13].

Centers for Disease Control and Prevention. Immunization schedules. [internet]. 2013 [accessed 2014 Jan 13].

Centers for Disease Control and Prevention. Influenza antiviral medications: summary for clinicians. [internet]. 2013 [accessed 2014 Jan 13].

Centers for Disease Control and Prevention. Methicillin-resistant Staphylococcus aureus (MRSA) infections: prevention information and advice for athletes. [internet]. 2010 [accessed 2013 Oct 21].

Centers for Disease Control and Prevention. Options for evaluating environmental cleaning. [internet]. 2010 [accessed 2014 Jan 13].

Guzman-Cottrill JA, Ravin KA, Bryant KA, Zerr DM, Kociolek L, Siegel JD, Society for Healthcare Epidemiology of America. Infection prevention and control in residential facilities for pediatric patients and their families. Infect Control Hosp Epidemiol. 2013 Oct;34(10):1003-41. PubMed

Jensen PA, Lambert LA, Iademarco MF, Ridzon R. Guidelines for preventing the transmission of Mycobacterium tuberculosis in health-care settings, 2005. MMWR Recomm Rep. 2005 Dec 30;54(17):1-141. [487 references] PubMed

Leung JM, Olivier KN. Nontuberculous mycobacteria in patients with cystic fibrosis. Semin Respir Crit Care Med. 2013 Feb;34(1):124-34. PubMed

Rutala WA, Weber DJ, Healthcare Infection Control Practices Advisory Committee (HICPAC). Guideline for disinfection and sterilization in healthcare facilities, 2008. [internet]. 2008 [accessed 2014 Jan 01].

Saiman L, Siegel J, Cystic Fibrosis Foundation. Infection control recommendations for patients with cystic fibrosis: microbiology, important pathogens, and infection control practices to prevent patient-to-patient transmission. Infect Control Hosp Epidemiol. 2003 May;24(5 Suppl):S6-52. [395 references] PubMed

Sehulster L, Chinn RY, CDC, HICPAC. Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC) [Published errata appear in MMWR Recomm Rep 2003 Oct 24;52(42):1025-6]. MMWR Recomm Rep. 2003 Jun 6;52(RR-10):1-42. [419 references] PubMed

Siegel JD, Rhinehart E, Jackson M, Chiarello L, Health Care Infection Control Practices Advisory Committee. 2007 guideline for isolation precautions: preventing transmission of infectious agents in health care settings. Am J Infect Control. 2007 Dec;35(10 Suppl 2):S65-164. PubMed

Siegel JD, Rhinehart E, Jackson M, Chiarello L, Healthcare Infection Control Practices Advisory Committee. Management of multidrug-resistant organisms in health care settings, 2006. Am J Infect Control. 2007 Dec;35(10 Suppl 2):S165-93. PubMed

Tablan OC, Anderson LJ, Besser R, Bridges C, Hajjeh R, Centers for Disease Control and Prevention (CDC), Healthcare Infection Control Practices Advisory Committee. Guidelines for preventing health-care--associated pneumonia, 2003: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee. MMWR Recomm Rep. 2004 Mar 26;53(RR-3):1-36. PubMed

World Health Organization. Guidelines on hand hygiene in healthcare. [internet]. 2009 [accessed 2014 Jan 13].

Type of Evidence Supporting the Recommendations

The type of supporting evidence is specifically stated for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate infection prevention and control for patients with cystic fibrosis (CF), which may lead to improved outcomes

Potential Harms

Adverse psychosocial impacts of isolation precautions

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Patient Resources

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Saiman L, Siegel JD, LiPuma JJ, Brown RF, Bryson EA, Chambers MJ, Downer VS, Fliege J, Hazle LA, Jain M, Marshall BC, O'Malley C, Pattee SR, Potter-Bynoe G, Reid S, Robinson KA, Sabadosa KA, Schmidt HJ, Tullis E, Webber J, Weber DJ. Infection prevention and control guideline for cystic fibrosis: 2013 update. Infect Control Hosp Epidemiol. 2014 Aug;35(Suppl 1):S1-S67. [500 references] PubMed

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2003 (revised 2014 Aug)

Guideline Developer(s)

Cystic Fibrosis Foundation - Disease Specific Society

Source(s) of Funding

The Cystic Fibrosis Foundation provided the publication costs for this document.

Guideline Committee

Cystic Fibrosis Foundation Guidelines Committee

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Financial Disclosures/Conflicts of Interest

None of the authors have financial support or conflicts of interest to disclose relevant to this guideline.

Guideline Endorser(s)

Association for Professionals in Infection Control and Epidemiology, Inc. - Professional Association

Society for Healthcare Epidemiology of America - Professional Association

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Saiman L, Siegel J, Cystic Fibrosis Foundation. Infection control recommendations for patients with cystic fibrosis: microbiology, important pathogens, and infection control practices to prevent patient-to-patient transmission. Infect Control Hosp Epidemiol 2003 May;24(5 Suppl):S6–S52.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Electronic copies: Available to subscribers from the Infection Control & Hospital Epidemiology Web site .

Availability of Companion Documents

The following is available:

- Robinson KA, Wilson LM, Akinyede O, Sawin VI, Burton B, Haberl E. Review of evidence for the Cystic Fibrosis Foundation Guidelines Committee: infection control in cystic fibrosis. Baltimore (MD): Johns Hopkins University; 13 Feb 2013. 44 p.

Additional resources, including frequently asked questions about the guideline and about various germs, tips on key recommendations, webcasts, infection prevention and control policy, and information on infection prevention and control at school, are available from the Cystic Fibrosis Foundation Web site .

Patient Resources

The following is available:

- When there's more than one person with CF in the same school. Bethesda (MD): Cystic Fibrosis Foundation. 2 p. Electronic copies: Available from the Cystic Fibrosis (CF) Foundation Web site .

In addition, various webcasts on germs and infection control are available from the CF Foundation Web site .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

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